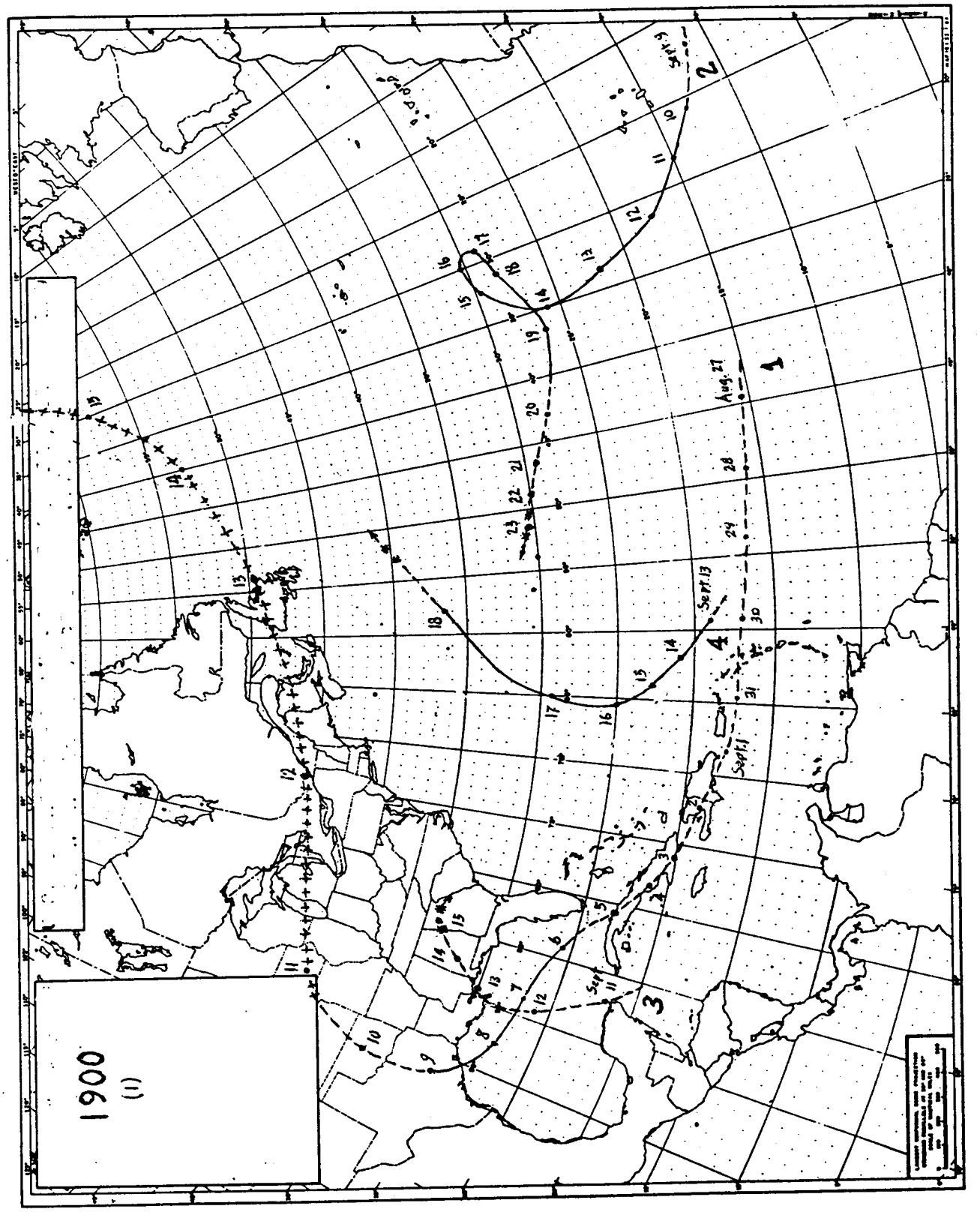

Fig. 3

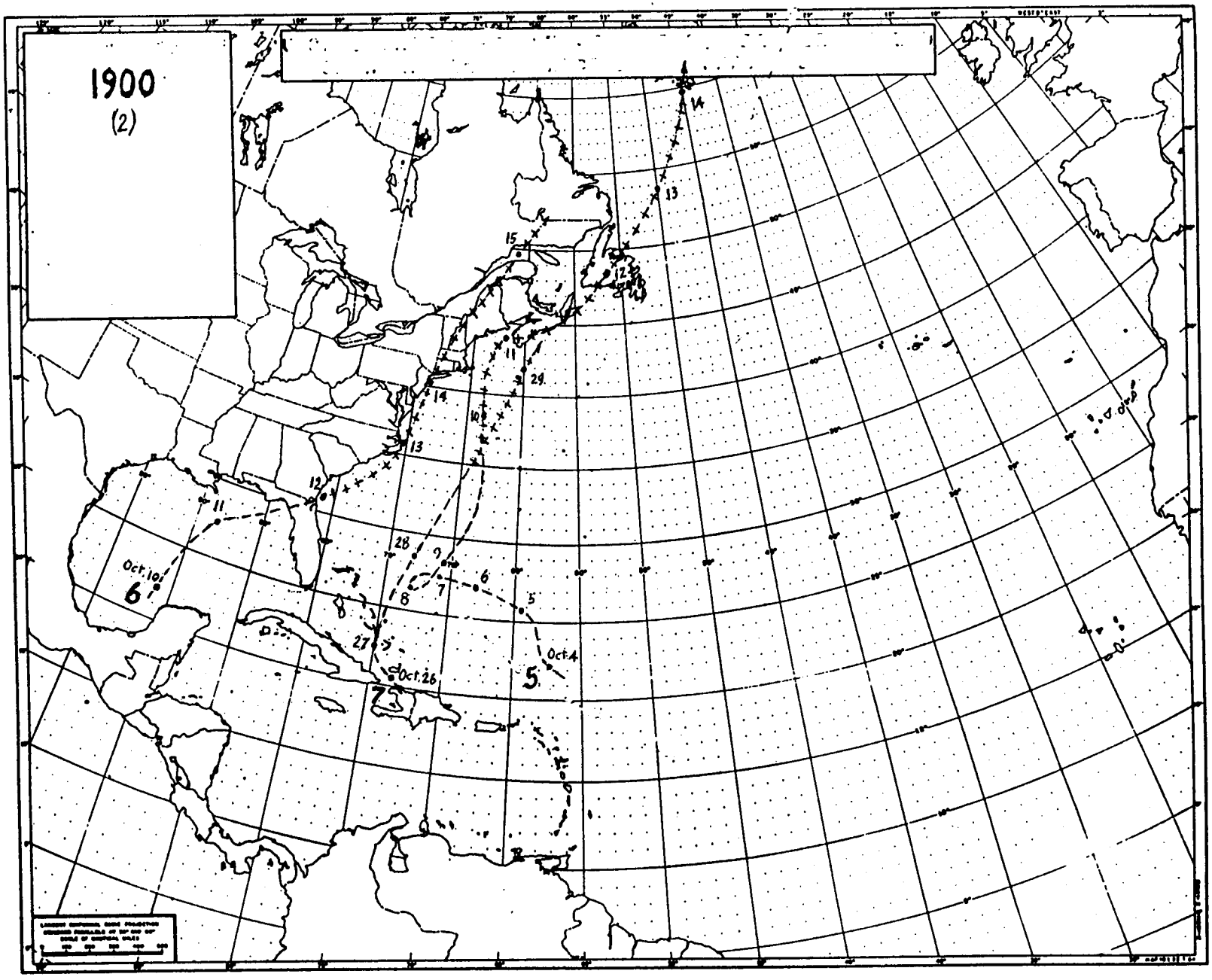

Fig. 3 (continued)

Sept. 17 and on the morning of Sept. 18 was evidently central a short distance S.E. of the southern New England coast, passing off the Newfoundland coast on the morning of Sept. 19 (Monthly Weather Review, Sept. 1900). Author's note: The above information about the storm was found to be in error over the period Sept. 17-19. 2) Information extracted from 8 A.M. (E.S.T.) weather maps: Sept. 6, ship near lat. 8 N., long. 23 W., wind N.W. force 5, barometer 29.77 inches. Sept. 7, ship near lat. 13 N., long. 32 W., wind W.S.W. force 4, barometer 29.91 inches; ship near lat. 17 N., long. 31 W., wind N.E. force 4; center of a low placed at lat. 15 N., long. 31 W. (Historical Weather Maps, Sept. 1900). Author's note: The above information might be related to the early stages of this storm. It seems to fit a good space-time continuity, as applied over 6 days, with the position the "Hungaria" encountered the storm on Sept. 13. This encourages one to believe that the system near the Cape Verde Islands on Sept. 6-7 could be the sane one near the Lesser Antilles on Sept. 13; however, such a relation cannot be stated in a conclusive manner. 3) Barbados, Oct. 14. Ship "Ostara", totally dismasted at lat. 14 N., long. 30 W. on Sept. 7, was towed here by ship "Karthago" (The Times, London, Oct. 5, 1900, p.6, col.5). Author's note: It is likely that the above accident was related to the storm; however, this cannot be stated in a conclusive manner). 4) Information extracted from 8 A.M. (E.S.T.) weather maps: Sept. 13, St. Kitts, wind N. force 3, barometer 29.90 inches; Dominica, wind S.W. force 2, barometer 29.92 inches; Barbados, wind S. force 2, barometer 29.95 inches; ship near lat. 16 N., long. 62 W., wind N.N.W. force 4; center of a low placed at lat. 18 N., long. 59 W. Sept. 14, ship near lat. 20 N., long. 63 W., wind N.W. force 7, barometer 29.83 inches; ship near lat. 25 N., long. 60 W., wind E. force 7, barometer 29.91 inches; center of a low placed at lat. 21 N., long. 60 W. Sept. 15, ship near lat. 20 N., long. 63 W., wind S.W. force 7; ship near lat. 21 N., long. 66 W., wind N.W. force 6; ship near lat. 23 N., long. 58 W., wind S.E. force 6; center of a low placed at lat. 21.7 N., long. 62 W. Sept. 16, center placed near lat. 25 N., long. 66 W.; several ships around the center; maximum wind speeds force 8-9; minimum pressure 29.47 inches reported by a ship W. of the center. Sept. 17, cyclone near Bermuda not chartered any longer, plotted data do not reveal it (Historical Weather Maps, Sept. 1900). 5) In regard to the storm at Bermuda, the Royal Gazette published the following: "Not since the memorable gale of the 12th and 13th of September, last year, has any thing approaching the blow we had on the 17th (Sept. 17, 1900) been experienced here. In the early morning of Monday (Sept. 17) the Sun rose looking very ominous and weather-prophets said that angry sunrise boded something more than usually severe; the glass was steadily falling and the wind fast increasing from the north-east; about 10 A.M. the wind backed to the N. very suddenly and it blew very hard, until at noon it was blowing with hurricane force and with little intermission till 8 P.M. when it commenced to moderate. Unfortunately the wind shifted so suddenly that the workmen who play between Somerset and the Dockyard in their boats had no time to save them and nearly the whole of them very smashed up to the sea just below Loyalty Lodge". No severe damage seems to have been done on land and the outstanding disaster was that 300

men from Dockyard had to remain in the Ireland Island side of the Ferry all night, "wet through, homeless and supperless" (Tucker, 1982). 6) Gibraltar, Oct. 3. Steamer "Taft", Baltimore for Genoa, encountered heavy gale in lat. 36 N., long. 57 W. on Sept. 18 and had decks swept, boats lost and sustained other damage (The Times, London, Oct. 4, 1900, p.4, col.3). 7) St. Vincent, Cape Verde Is., Oct. 4: Steamer "Vera Cruz II", St. John, N.B. to St. Vincent, C.V. capsized during a gale Sept. 18. Crew taken by U.S. ship "St. Paul" and landed here (The Times, London, Oct. 5, 1900, p.10, col.4). 8) Storm of Sept. 13-20, 1900. Atlantic (Tannehill, 1938). 9) Map showing a partial track for this storm. The following positions were read off the track: Sept. 17 (evening), Bermuda; Sept. 18 (morning), near lat. 41 N., long. 70 W.; Sept. 18 (evening), near lat. 44.3 N., long. 61 W. (Monthly Weather Review, Sept. 1900). Author's note: The above track was found to be in error. 9) A storm was first observed near lat. 19 N., long. 57 W. on Sept. 13, 1900 and lasted 7 days; it recurved at lat. 27 N., long. 66 W. and it was last observed near lat. 67 N., long. 22 W. (Mitchell, 1924). Author's note: A track for this storm which is included in Mitchell (1924) was found to be quite similar to the one in Neumann et al. (1993); however, the latter authors terminated their track much earlier than Mitchell (1924) did.

Information in the above items suggested the introduction of some modifications along the track for Storm 4, 1900 which is shown in Neumann et al. (1993). The author of this study estimated 7 A.M. positions for the period Sept. 13-14 and for Sept. 16 on the basis of a careful analysis of information in items 1) annd 4); the 7 A.M. position for Sept. 15 in Neumann et al. (1993) was kept unchanged because it was found to agree with the author's analysis. The following new positions were estimated: Sept. 13, near 19.0 degrees N., 59.3 degrees W.; Sept. 14, near 21.0 degrees N., 62.0 degrees W.; Sept. 16, near 25.0 degrees N., 65.5 degrees W. These positions were about 140 miles to the W., about 60 miles to the W. and about 60 miles to the S.S.E. of the respective positions in Neumann et. al (1993). The author's 7 A.M. Sept. 17 position was estimated near 29.3 degrees N., 65.0 degrees W. on the basis of information for Bermuda contained in item 5); this position was found to be about 50 miles to the S.W. of the corresponding one in Neumann et al. (1993). The author's 7 A.M. Sept. 18 position was chiefly based on information furnished by the "Taft" (item 6) and was estimated near 36.5 degrees N., 58.0 degrees W; this position was found to be about 150 miles to the N. of the corresponding one in Neumann et al. (1993). A smooth curve joining the 7 A.M. positions for Sept. 17 and Sept. 18 allowed the author to bring the storm significantly closer to the E. of Bermuda than along the track shown in the above mentioned publication; this proximity supported much better the occurrence of hurricane winds at that island (item 5). Finally, information in items 2) and 3) suggested the possibility of extending the track backwards in time to the eastern Atlantic, near the Cape Verde Islands, on Sept. 6-7, but this was not done because the author could not present any definitive proof that the weather systems near the Cape Verde Islands on the above mentioned days and off the Leeward Islands on Sept. 13 were, indeed, just one. The author's track for Storm 4,

1900 is displayed in Fig. 3.

The hurricane status that Neumann et al. (1993) gave to this storm was found to be supported by information in the above items, item 5) in particular. With the exception of small portions of the author's track at its beginning and end, hurricane intensity was denoted along the track over the entire period Sept. 13-18.

Storm 5, 1900 (Oct. 1-14), T. S.

The following information was found about this storm: 1) Extracted from 8 A.M. (E.S.T.) weather maps: Oct. 5, ship near lat. 24.5 N., long. 64.5 W., wind W. force 3, barometer 30.12 inches (too high); ship near lat. 27 N., long. 67 W., wind N. force 3, barometer 29.74 inches (probably too low); ship near lat 28 N., long. 68 W., wind N.E. force 4, barometer 30.00 inches. Oct. 6, ship near lat. 30.7 N., long. 65 W., wind E. force 4, showers; ship near lat. 32 N., long. 67 W., wind E.N.E. force 3,; ship near lat. 26.7 N., long. 66.7 W., wind S. force 6, barometer 30.00 inches; ship near lat. 30 N., long. 72 W., wind N.N.W. force 2 (wind direction probably wrong); ship near lat. 26.7 N., long. 73 W., wind N.N.E. force 4, barometer 30.06 inches; ship near lat. 28.7 N., long. 74 W., wind N.N.E. force 5, barometer 30.12 inches; ship near lat. 21.7 N., long. 67 W., wind S.W. force 5, barometer 29.97 inches. Oct. 7, Turk Is., wind W. force 2, barometer 29.95 inches; ship near lat. 23 N., long. 74 W.,, wind N.W. force 3, , barometer 29.91 inches; ship near lat. 27 N., long.74 W., wind N.N.E. force 3; ship near lat. 29 N., long. 70 W., wind E. force 5, barometer 29.97 inches; ship near lat. 29 N., Long. 68 W., wind E. force 6; ship near lat. 29.8 N., long. 69 W., wind E. force 5, barometer 30.15 inches (too high). Oct. 8, ship near lat. 26 N., long. 75 W., wind N.N.W. force 5, barometer 29.80 inches; ship near lat. 23 N., long. 74 W., wind W. force 3, barometer 29.91 inches; Turk Is., wind S.W. force 3, barometer 29.94; ship near lat. 26 N., long. 67 W., wind S.E. force 6, barometer 30.03 inches; ship near lat. 27 N., long. 67 W., wind S. force 4; ship near lat. 30 N., long. 74 W., wind S.E. force 4 (wind direction probably in error), barometer 29.94 inches; ship near lat. 31 N., long. 75 W., wind E. force 2; center of a low placed near lat. 26 N., long. 73 W. Oct. 9, ship near lat. 31 N., long. 69.3 W., wind E.S.E. force 9; ship near lat. 29 N., long. 72 W., wind N.E. force 6, barometer 29.91 inches; ship near lat. 28 N., long. 65 W., wind S.E. force 8; ship near lat. 26 N., long. 66 W., wind S. force 4, barometer 30.06 inches; ship near lat. 25 N., long. 69 W., wind S.W. force 3; center of a low placed near lat. 28.3 N., long. 69 W. (probably too far E. by about 100 miles). Oct. 10, system incorporated to a front; frontal low near lat. 38.5 N., long. 68.5 W. (Historical Weather Maps, Oct. 1900). 2) The storm was first observed at Bermuda (on the morning of Oct. 10, according to a table); moved N.W. to the Massachusetts coast, and then N.E. along the coast to Cape Breton Island and, according to the table, it was last observed at lat. 46 N., long 60 W. (Monthly Weather Review, Oct. 1900). 3) A storm of slight intensity moved N.E. from the southern New England coast to eastern Maine (The New York Times, Oct. 11, 1900, p.3, col.4). 4) The New England storm is now off Nova Scotia. It caused heavy rains and high winds

yesterday in Maine. Storm warning is displayed at Eastport (The New York Times, Oct. 12, 1900, p.5, col.4). 5) Storm of Oct. 4-14, 1900. Atlantic (Tannehill, 1938). 6) Map showing a track for this storm. Positions along the track were as follows: Oct. 9 (evening) and Oct 10 (morning), vicinity of Bermuda; Oct. 10 (evening), vicinity of Nantucket; Oct. 11 (morning), vicinity of Eastport, Me.; Oct. 11 (evening), vicinity of Cape Breton Island (Monthly Weather Review, Oct. 1900). 7) A storm was first observed near lat. 22 N., long. 63 W. on Oct. 4, 1900 and lasted 10 days; it recurved near lat. 29 N., long. 74 W. and it was last observed, near lat. 60 N., long 46 W. (Mitchell, 1924). Author's note: The track for this storm which is also included in Mitchell (1924) was found to be very similar to the one in Neumann et al. (1993).

By making use of information in the above items, the author of this study introduced some modifications along the storm track displayed in Neumann et al. (1993). 7 A.M. positions for the period Oct. 4-7 were kept unchanged because they were found to be reasonable in the light of information in item 1). The author's 7 A.M. Oct. 8 position was estimated near 26.5 degrees N., 73.0 degrees W. on the basis of information for that day in item 1); this position was found to be about 120 miles to the S. of the corresponding position in Neumann et al. (1993). The author's 7 A.M. Oct. 9 position was also estimated by using pertinent information in item 1) and was near 28.3 degrees N., 70.7 degrees W.; this position was found to be about 140 miles to the S. of the morning position shown in Neumann et al. (1993) for that day. The author's 7 A.M. Oct. 10 position was estimated near 38.5 degrees N., 68.5 degrees W. on the basis of information for that day contained in item 1); such a position was about 270 miles to the N. of the corresponding one in Neumann et al. (1993). The author's 7 A.M. Oct. 11 position was primarily based on information in items 3) and 6) and was estimated near 44.0 degrees N., 67.0 degrees W; this position was about 200 miles to the N.N.W. of the one shown in Neumann et al. (1993) for that day. The author's 7 A.M. Oct. 12 position was estimated near 48.5 degrees N., 56.5 degrees W. on the basis of achieving space-time continuity along the track from a position near Cape Breton Island in the evening of Oct. 11 (item 6) to the 7 A.M. Oct. 13 position in Neumann et al. (1993) which was kept unchanged. The 7 A.M. Oct. 14 position in the above publication was kept unchanged as well. The author's track for Storm 5, 1900, which made the storm to describe a small loop on Oct. 8, is displayed in Fig. 3.

Support for the tropical storm status which Neumann et al. (1993) gave to this storm was found in the ship observation showing an E.S.E. wind force 9 in the morning of Oct. 9. The author's track denotes tropical storm intensity over the period Oct. 4-9, in spite that there are some indications (wind velocities in item 1) that the storm might have not reached that intensity until Oct. 9. Finally, the author's track denotes an extratropical stage starting on Oct. 10, as supported by information for that day contained in item 1).

Storm 6 (Oct. 10-15), T. S.

The following information was found about this storm: 1) Extracted from 8 A.M. (E.S.T.) weather maps: Oct. 8, ship near lat. 19 N., long. 85 W., wind E. force 2, barometer 30.06 (probably too high); ship near lat. 16.7 N., long. 87 W., wind N.E. force 5; Merida, wind S. force 2, barometer 29.99 inches. Oct. 9, Merida, wind N.E. force 1, barometer 29.95 inches. Oct. 10, Merida, wind S. force 2, barometer 29.97 inches; ship near lat. 21 N., long. 92 W., wind N.W. force 2, barometer 29.83 inches; ship near lat. 25 N., long. 85 W., wind S.E. force 4, barometer 29.91 inches; ship near lat. 27 N., long. 89 W., wind N.N.W. force 4, barometer 29.24 inches (too high); Pensacola, wind N.E. force 3, barometer 29.98 inches; Port Eads, wind N. force 3, barometer 29.98 inches. Oct. 11, Pensacola, wind E.N.E. force 5, barometer 29.88 inches; ship near lat. 26.5 N., long. 90 W., wind W.N.W. force 3, barometer 30.03 inches (too high); ship near lat. 25.7 N., long. 86.2 W., wind S.S.E. force 3, barometer 29.88 inches; wind near lat. 25.7 N., long. 85.2 W., wind S.W. force 1, barometer 29.88 inches; Tampa, wind E.N.E. force 1, barometer 29.91 inches. Oct. 12, ship near lat. 30 N., long. 79 W., wind S.W. force 3, barometer 29.71 inches; Jacksonville, wind N.W. force 2 (pressure could not be read off the map); Tampa, wind S.E. force 3, barometer 29.79 inches; Jupiter, wind S.W. force 2, barometer 29.83 inches; Pensacola, wind N.W.force 3, barometer 29.86 inches; several ships in the Gulf, from lat. 25 N., long. 86 W. to the Mississippi delta, showing N.W. winds; system looks extratropical in nature (Historical Weather Maps, Oct. 1900). 2) The storm originated over eastern Cuba (according to a table it originated near lat. 20 N., long. 76 W. in the morning of Oct. 10), moved northwestward off the west Florida coast, and then turned northward along the coast of Maine, finally passing out beyond the Gulf of St. Lawrence (Monthly Weather Review, Oct. 1900). Author's note: A table in the above publication shows that the storm was observed for last time near lat. 49 N., long. 68 W. in the evening of Oct. 15. In addition, the early part of the evolution described in the above item was found to be in error. 3) The Gulf storm is apparently off the western Florida coast. The winds are as yet light; but give promise of increasing in intensity (The New York Times, Oct. 12, 1900, p.5, col.6). Author's note: The above statement was probably issued in the evening of Oct. 11. 4) Belen College Observatory, Oct. 12. 11:50 A.M. Since Wednesday last (Oct. 10) we have been under the influence of a well defined cyclonic perturbation in the Gulf of Mexico. All day yesterday we had it to the N.W. one-quarter to the W. at a distance of some 300 miles, controlling our breezes with greater intensity than on the previous day, and it will probably cross Florida into the Atlantic where we believe its effects are already being felt. L. Gangoiti, S.J. (Diario de la Marina, Havana, Oct. 12, 1900, evening edition, p.2, col.6). Author's note: The content of the above item implies that the storm did not form over eastern Cuba as indicated in item 2). 5) There is a storm of considerable energy apparently central on the Atlantic Ocean E. of the northern Florida coast. Brisk to high N.E. winds prevailed along the Carolina coast yesterday. Rain has fallen from the

Carolinas southward to Florida (The New York Times, Oct. 13, 1900, p.4, col.7). Author's note: The storm center was off the N.E. coast of Florida in the morning of Sept. 12. 6) The South Atlantic coast storm was central last night on the Virginia coast. It will move N. and N.E., causing brisk and high winds on the New Jersey, southern New England and Massachusetts coasts today (The New York Times, Oct. 14. 1900, p.4, col.6). 7) The steamer "Chesapeake", which passed out at Sandy Hook at 6:30 P.M. last evening, bound for Baltimore, was obliged to return to New York owing to the gale. She passed in again soon after midnight (The New York Times, Oct. 14, 1900, p.10, col.3). 8) The storm that was central in New Jersey yesterday morning has moved to the Massachusetts coast, its center last night being apparently at sea S.E. of Nantucket (The New York Times, Oct. 15, 1900, p.2, col.3). 9) The maximum wind velocity at Savannah was E. 24 mph on Oct. 11; it was E. 37 mph at Charleston on Oct. 12 (Monthly Weather Review, Oct. 1900). 10) Storm of Oct. 9-15, 1900. Western Caribbean, Yucatan, Gulf, Atlantic coast. Not of much intensity (Tannehill, 1938). Author's note: Indications are that the storm formed in the Gulf of Mexico and not in the western Caribbean Sea. 11) Storm of Oct. 13, 1900. Cape Hatteras. Minor (Dunn and Miller, 1960). 12) Map showing a track for this storm. Positions along the track were as follows: Oct. 10 (morning), just W. of Santiago de Cuba; Oct 10 (evening), near Havana; Oct. 11 (morning), near lat. 26 N., long. 84.5 W.; Oct. 11 (evening) and Oct. 12 (morning), vicinity of Tampa; Oct. 12 (evening), near Jacksonville; Oct. 13 (morning), near Cape Hatteras; Oct. 13 (evening), near lat. 37 N., long. 76 W.; Oct. 14 (morning), near lat. 39 N., long. 74.5 W.; Oct. 14 (evening), near lat. 41.3 N., long. 72 W.; Oct. 15 (morning), near lat. 43.5 N., long. 67.5 W.; Oct. 15 (evening), near lat. 48 N., long 67.5 W. (Monthly Weather Review. Oct. 1900). Authors note: Positions for Oct. 10 were found to be in error and positions for Oct. 11 and for Oct. 12 were questionable. 13) A storm was first observed near lat. 18 N., long. 87 W. on Oct. 9, 1900 and lasted 6 days; it recurved near lat. 23 N., long. 91 W.and was last observed near lat. 50 N., long. 66 W. (Mitchell, 1924). Author's note: Mitchell (1924) also shows a track for the storm which was found to be, in general, quite similar to the corresponding one in Neumann et al. (1993). However, there is a significant difference between the two tracks: both were started near lat. 18 N., long. 87 W., but Neumann et al. (1993) did it on Oct. 8 while Mitchell (1924) did it on Oct. 9.

On the basis of information in the above items, the author of this study introduced some modifications along the track for Storm 6, 1900 which is shown in Neumann et al. (1993). No positions were determined for Oct. 8-9 because ship information in item 1) showed a straight E. to N.E. flow over the extreme western Caribbean Sea where the storm allegedly existed in the morning of Oct. 8, and the N.E. wind force 1, with a pressure of 29.95 inches, reported at Merida on Oct. 9 (item 1) did not support any storm in the vicinity of that city, where Neumann et al. (1993) showed their storm position for 7 A.M. Oct.9. Consequently, the author of this study decided to eliminate the track in Neumaan et al. (1993) for Oct. 8-9 and to start his own track on Oct. 10. Information from Merida and from a ship near lat. 21 N., long. 92 W. allowed him to

estimate his 7 A.M. Oct. 10 position near 22.0 degrees N., 91.0 degrees W., which was found to be about 80 miles to the S. of the corresponding position displayed in Neumann et al. (1993). The author's 7 A.M. Oct. 11 position was primarily based on an analysis of information for that day contained in item 1) and, to a lesser extent, on information in item 4); his position was estimated near 27.3 degrees N., 88.5 degrees W. and was found to be about 60 miles to the W.N.W. of the corresponding one in Neumann et al. (1993). The 7 A.M. Oct. 12 position in the latter publication was kept unchanged because it was found to satisfy information for that day in item 1); similarly, the 7 A.M. Oct. 13-15 positions in the same publication were also kept unchanged as they were found to agree quite well with corresponding morning positions in item 12). The author's track for this storm is displayed in Fig. 3.

On the basis of information in item 1) which showed no particularly high winds on Oct. 10-11, one would tend to believe that there was a good chance that Storm 6, 1900 failed to attend tropical storm status before becoming an extratropical system on Oct. 12 as supported by information for that day in item 1). However, in spite of that possibility, the author of this study decided to keep the tropical storm status which Neumann et al (1993) gave to this storm, his decision being based on the fact that no definitive proof against the existence of tropical storm winds could be presented.

Storm 7, 1900 (Oct. 26-29). T. S.

The following information was found in relation to this storm: 1) Extracted from 8 A.M. (E.S.T.) weather maps: Oct. 23, Barbados, wind E. force 3, barometer 29.88 inches; Martinique, wind E.N.E. force 2, barometer 29.89 inches; Dominica, wind W. force 1, barometer 29.89 inches; ship near lat. 14 N., long. 63 W., wind N.E. force 3, barometer 29.77 inches (probably too low); St. Kitts, wind E. force 3, barometer 29.94 inches (not clearly read off the map); San Juan, wind S.E. force 3, barometer 29.95 inches. Oct. 24, San Juan, wind S.E. force 3, barometer 29.88 inches; ship near lat. 15 N., long 64 W, wind S.S.E. force 2, barometer 29.86 inches; ship near lat. 15 N., long. 68 W., calm, barometer 29.83 inches; Santo Domingo, wind N. force 4, barometer 29.93 inches; ship near lat. 29 N., long. 69 W., wind N.E. force 6; ship near lat. 22 N., long. 65.5 W., wind E.N.E. force 7, barometer 30.00 inches; Turk Is., wind N.E. force 6, barometer 30.03 inches; St. Kitts, wind E. force 3, barometer 29.88 inches; Dominica, wind S.W. force 2, barometer 29.83 inches; Barbados, wind E. force 4, barometer 29.83 inches. Oct. 25, San Juan, wind S. force 2, barometer 29.88 inches; ship near lat. 20 N., long. 64 W., wind S.E. force 3, barometer 29.88 inches; St. Kitts, wind S.E. force 1, barometer 29.88 inches; Dominica, wind S.E. force 3, barometer 29.87 inches; Santo Domingo, wind N. force 3, barometer 29.89 inches; ship near lat. 21 N., long. 67 W., wind E.S.E. force 2, barometer 29.91 inches; ship near lat. 22 N., long. 67 W., wind E.N.E. force 3, barometer 29.91 inches; ship near lat. 23 N., long. 65 W., wind E. force 6, barometer 29.91 inches; Turk Is., wind S.E. force 3, barometer 29.95 inches; ship near lat. 15 N., long. 68 W., wind N.E. force 2,

barometer 29.88 inches. Oct. 26, Turk Is., wind S.E. force 3, barometer 29.93 inches; Santo Domingo, wind N. force 1, barometer 29.94 inches; Santiago de Cuba, wind N.W. force 2, barometer 29.83 inches, Port-au-Prince, wind W.S.W. force 2, barometer 29.84 inches; Camaguey, wind N. force 3, barometer 29.86 inches; Key West, wind N.E. force 4, barometer 30.03 inches; ship near lat. 25 N., long. 80 W., wind N.N.E. force 7; ship near lat. 25.7, long. 78.7 W., wind N.N.E. force 6, barometer 30.06 inches; ship near lat. 25.7 N., long. 74 W., wind N.N.E. force 10 (probably too high), barometer 29.97 inches; ship near lat. 28 N., long. 73 W., wind N.E. force 6, barometer 30.06 inches; ship near lat. 27 N., long. 68 W., wind E.N.E. force 7, barometer 30.15 inches; ship near lat. 25.7 W., long 67.5 W., wind W.S.W. force 2 (direction probably wrong), barometer 30.03 inches; ship near lat. 24 N., long. 66 W., wind S.S.E. force 3, barometer 29.91 inches; San Juan, wind S. force 2, barometer 29.92 inches. Oct. 27, Havana, wind N. force 4, barometer 29.90 inches; Cienfuegos, wind N.W. force 2, barometer 29.84 inches; Camaguey, wind S.W. force 2, barometer 29.84 inches; Santiago de Cuba, wind S. force 1, barometer 29.84 inches; Turk Is., wind S. force 3, barometer 29.89 inches; Key West, wind N.E. force 5, barometer 29.93 inches; Jupiter, wind N.E. (velocity could not be read off the map), barometer 29.90 inches; ship near lat. 23 N., long. 79.7 W., wind N.N.E. force 6; ship near lat. 22.7 N., long. 74.7 W., wind E.N.E. force 4, barometer 30.09 inches (obviously too high); ship near lat. 25.7 N., long. 74.7 W., wind E. force 3, barometer 29.94 inches; ship near lat. 26.7 N, long. 72.7 W., wind S.E, force 6, barometer 29.80 inches (probably too low); sip near lat. 28.8 B., long. 74.8 W., wind E. force 8, barometer 30.00 inches; ship near lat. 27.7 N., long. 78.7 W., wind N.E. force 8; center of a low near lat. 24.5 N., long. 77.5 W. Oct. 28, Havana, wind N.W. force 4, barometer 29.86 inches; Key West, wind N. force 2, barometer 29.84 inches; Jupiter, wind N. force 3, barometer 29.82 inches; Cienfuegos, wind W. force 2, barometer 29.82 inches; Camaguey, wind S.W. force 1, barometer 29.84 inches; ship off Andros Is., wind N.N.E. force 5, barometer 29.80 inches; ship near lat. 25.7 N., long. 77.5 W., wind E.N.E. force 3, barometer 29.88 inches; ship near lat. 25.8 N., long. 75 W., wind W. force 2; ship near lat. 26.7 N., long. 73.7 W., wind W. force 4, barometer 29.83 inches; ship near lat. 25.8 N., long. 73.8 W., wind W.S.W. force 4, barometer 29.91 inches; ship near lat. 20.8 N., long. 73 W., wind S.W. force 4, barometer 29.86 inches; Turk Is., wind S.W. force 2, barometer 29.93 inches; center of a low near lat. 25.5 N., long 77 W. (data suggest the center to be farther S. than indicated and also suggest the presence of a second low , probably more important than the previous one, roughly in the vicinity of lat. 28.5 N., long. 73 W.). Oct. 29, a weak low remained near Andros Is.; however, the second low which was near lat. 28.5 N., long. 73 W. on Oct. 28 was identified as the frontal wave about 200 miles to the S.S.W. of Halifax, near lat. 42 N., long. 65 W. (Historical Weather Maps, Oct. 1900). 2) A tropical disturbance of moderate energy, which was first noted on the morning of Oct. 23 over the southern portion of the Windward Islands, moved very slowly northwestward to the Bahamas and then recurved to the N.E. It was finally noted while passing Bermuda

(Monthly Weather Review, Oct. 1900). Author's note: A table which was also published in the Monthly Weather Review, Oct. 1900, showed that this system was first observed near lat. 15 N., long. 62 W. in the morning of Oct. 23 and was last observed near lat. 32 N., long. 65 W. in the morning of Oct. 30. 3) Belen College Observatory, Oct. 26, 11:40 A.M. Telegrams received from the Windward Islands indicated a depression of weak intensity over the eastern Caribbean Sea on Oct. 24. The barometer at St. Thomas was somewhat lower than at Barbados. The barometers at Santiago de Cuba and Jamaica have continued dropping yesterday and today, a signal that the perturbation propagated to the W. Here (at Havana) we have had an anticyclone since Sunday (Oct. 21), accompanied by rain. L. Gangoiti, S.J. (Diario de la Marina, Havana, Oct. 26, 1900, evening edition, p.2, col.1). 4) Belen College Observatory, Oct. 27, 11 A.M. The small perturbation, which was to the S.E. of us yesterday, caused some rain at Santiago de Cuba last night and is passing over the province of Puerto Principe (Camaguey) this morning, accompanied by drizzle in some places but without any danger for this island. It would emerge over the Bahama Channel with weak intensity but it would not be surprising if it intensifies over open waters. L. Gangoiti, S.J. (Biario de la Marina, Oct. 27, 1900, evening edition, p.2, col.3). 5) A tropical disturbance was central last night over the Bahamas and was moving slowly northwestward. A maximum wind velocity of 32 mph from the N.E. was reported on the afternoon at Jupiter, Fl. (The New York Times, Oct. 28, 1900, p.5, col.5). 6) The tropical disturbance noticed Saturday morning (Oct. 27) as being central to the N. of the E. end of Cuba was central last evening to the eastward of the southern Florida coast. It has not moved any during 24 hours and was not increasing in intensity (The New York Times, Oct. 29, 1900, p.2, col.6). 7) The barometer is still low over southern Florida and Cuba (The New York Times, Oct. 30, 1900, p.9, col.7). 8) Storm of Oct. 23- Nov. 2, 1900. Windward Islands, Puerto Rico, Bermuda (Tannehill, 1938). Author's note: It appears that the storm was unimportant in the Windward Islands. Salivia (1972) does not show it as having affected Puerto Rico and Tucker (1982) does not record the storm at Bermuda either. 9) Map showing a track for this storm. The track shows the storm to have been over extreme eastern Cuba in the morning of Oct. 26, near lat. 22 N., long. 75 W. on the morning of Oct. 27, practically stationary in the vicinity of Nassau on Oct. 28-29 and having reached the vicinity of lat. 32 N., long. 66.5 W. (about 100 miles W. of Bermuda) by the morning of Oct. 30 (Monthly Weather Review, Oct. 1900). 10) A storm was first observed near lat. 24 N. (it should read 14 N.), long. 61 W. on Oct. 23, 1900 and lasted 10 days; it recurved near lat. 27 N., long. 74 W. and it was last observed near lat. 65 N., long. 30 W. (Mitchell, 1924). Author's note: A track which is also shown in Mitchell (1924) was found to have some similarity with the one displayed in Neumann et. al. (1993).

On the basis of the content of the above items, the author of this study introduced some modifications along the track for Storm 7, 1900 in Neumann et al. (1993). Using information in item 1), the author determined that daily positions could not be inferred prior to Oct. 26 because the data available was not found to support the

existence of a closed cyclonic circulation. Therefore, the author decided to discard the portion of the track in Neumann et al. (1993) for the period Oct. 23-25 and to start his own track on Oct. 26. The author's 7 A.M. Oct. 26 position was primarily based on information for that day contained in item 1), although items 3) and 9) were also taken into account; such a position was estimated near 20.5 degrees N,, 73.5 degrees W. and was found to be about 180 miles to the W.S.W. of the corresponding one in Neumann et al. (1993). The author's 7 A.M. Oct. 27 position was chiefly based on a careful analysis of the information for that day in item 1) and, to a lesser extent, on information in items 4), 6) and 9). The author's analysis of the available data for that day showed a broad center of cyclonic circulation on the northern coast of central Cuba, which was in line with the storm having passed over the province of Puerto Principe (Camaguey in the morning of Oct. 27 (item 4). However based on a) a wind from the S. at Turk Is. which was accompanied by a pressure drop from 29.93 inches on Oct. 26 to 29.89 inches and b) a wind from the E.N.E. reported by a ship near lat. 22.7 N., long. 74.7 W. (item 1), the author inferred that a second low pressure center was trying to develop near the Crooked Island Passage (southeastern Bahamas), in a position which was found to be supported by the position "N. of the E. end of Cuba" given in item 6) and the location shown on the map referred to in item 9). Because the position of this second center fits better the space-time continuity with his 7 A.M. position for Oct. 28, the author accepted the position of such a center, which was near 22.5 degrees N., 75.0 degrees W. as his 7 A.M. Oct. 27 position. It should be mentioned that the author's 7 A.M. Oct. 27 position was found to be about 90 miles to the S. of the corresponding one in Neumann et al. (1993). The author's analysis for Oct. 28 shows again the existence of the two centers of cyclonic circulation: one of them near Andros Island in the Bahamas and the second one near lat,. 28.5 N., long. 73 W. Support for the location of both centers was drawn from the meteorological data available for that day (item 1). The northeasternmost center appears to have been the prominent one. This is why the author accepted it for his 7 A.M. Oct. 28 position (28.5 degrees N., 73.0 degrees W.), leaving the other center to remain almost stationary over the Bahamas as referred to in items 6), 7) and 9). The author's 7 A.M. Oct. 29 position was estimated near 42.0 degrees N., 65.0 degrees W. on the basis of information for that day in item 1); this position was found to be about 350 miles to the N. of the corresponding one in Neumann et al. (1993). The author's track for Storm 7, 1900 is shown in Fig. 3.

The author of this study decided to keep unchanged the tropical storm status which Neumann et al. (1993) gave to this storm, his decision being based on several reports of winds force 8 shown in item 1). The transition of the tropical weather system into an extratropical one was denoted along the author's track as the storm passed to the N. of the 35 degrees N. parallel.

Special statement.

In addition to the storms which were fully discussed above, four possible cases were found for 1900. Information available for these four cases was found to be insufficient to determine that such weather systems attained tropical storm intensity and/or to study their space-time evolution.

Case of Jun. 9-13.

The following information was found about this possible case: 1) Extracted from 8 A.M. (E.S.T.) weather maps: Jun. 9, Pensacola, wind N.N.E. force 5, barometer 29.87 inches; Port Eads, wind N. force 1, barometer 29.77 inches (probably too low); Tampa, wind S. force 3, barometer 29.90 inches; ship near lat. 27 N., long. 84 W., wind S.W. force 5, barometer 29.97 inches; center of a low placed near lat. 28 N., long. 86.5 W. Jun. 10, Pensacola, wind N.E. force 3, barometer 29.88 inches; Tampa, wind E. force 2, rain, barometer 29.87 inches; ship near lat. 28 N., long. 87 W., wind N.N.W. force 3; ship near lat. 26 N., long. 85 W.; wind N.W. force 4, barometer 29.94 inches; center of a low placed near lat. 28.5 N., long. 84.5 W. Jun. 11, Pensacola, wind E.N.E. force 5, barometer 29.88 inches; New Orleans, wind N.E. force 4, barometer 29.90 inches; ship near lat. 27.5 N., long. 86.7 W., wind E. force 5; ship near lat. 27.5 N., long. 87.7 W., wind N. force 5; ship near lat. 26.7 N., long. 85.7 W., wind S.W. force 3; center of a low placed near lat. 27 N., long. 87 W. Jun. 12, New Orleans, wind N. force 4, barometer 29.79 inches; Pensacola, wind S.E. force 5, barometer 29.88 inches; ship near lat. 27.7 N., long. 87.7 W., wind S.W. force 6, barometer 29.88 inches; ship near lat. 26.5. long. 85.7, wind S. force 4, barometer 29.94 inches; center of a low placed near lat 29.5 N., long. 89.5 W. Jun 13, center of a low placed near lat. 31.5 N., long. 90 W. (Historical Weather Maps, Jun. 1900). 2) A disturbance appeared off the Louisiana coast in the morning and apparently increased in intensity during the day, causing brisk E. and N.E winds and heavy local rains on the MIddle Gulf coast. This disturbance is likely to increase in strength today and cause high winds over the Middle and West Gulf (The New York Times, Jun. 13, 1900, p.9, col.1). 3) The disturbance which appeared off the mouth of the Mississippi River Tuesday (Jun. 12) has dissipated over the Lower Mississippi Valley (The New York Times, Jun. 14, 1900, p.3, col.4). The content of the above items allowed one to infer the existence of a low pressure area over the central and eastern Gulf of Mexico, which finally moved over Louisiana on Jun. 12 and dissipated over the Lower Mississippi Valley the next day. However, the information above was found to be insufficient to prove or to disprove that this weather system attained tropical storm status. This is why the system was kept as a possible case.

Case of Jun. 12-17.

The following information was found in relation with this possible case: 1) Extracted from 8 A.M. (E.S.T.) weather maps: Jun. 12, center of a low placed near lat. 22.5 N., long. 67.5 W.; one

ship reported N.E. wind; 3 ships reported S.W. winds, one of them a light S.W. wind near the center. Jun. 13, center of a low placed near lat. 27.5 N., long. 69.5 W.; 2 ships showed S.W. winds, one of them reporting force 7. Jun. 14, center of a low placed near lat. 27 N. long. 64 W., but no ships were shown near the center. Jun. 15, ship near lat. 29 N., long, 72 W., wind N.E. force 6; ship near lat. 27 N., long. 68.7 W., wind N.N.E. force 3; ship near lat. 25.5 N., long. 66 W., wind W.S.W. force 9; a second ship near the same location, wind S.W. force 4; center of a low placed near lat. 27.5 N., long. 63.5 W. Jun. 16, ship near lat. 26 N., long. 67 W., wind S. force 8; ship near lat. 27 N., long. 74 W., wind N. force 5; ship near lat. 30 N., long. 68 W., wind E. force 6; a second ship near the same location, wind E. force 4; center of a low placed near lat. 27.5 N., long. 70 W. Jun. 17, center of a low placed near lat. 30 N., long. 70.5 W.; embedded in a cold front (Historical Weather Maps, Jun. 1900) The above information showed the existence of a low to the N. and N.E. of Puerto Rico which moved on a general N.W. course to the N.E. of the northern Bahamas. The author of this study believes that this system had a good chance to have become a tropical storm. However, he also believes that it was too risky to determine tropical storm intensity on the basis of only one ship observation showing a wind of force 8 and a second one showing a questionable wind of force 9 because it was taken practically in the same location where another ship reported a wind of force 4. This was why this weather system was kept as a possible case.

C) Case of Jul. 25-27.

The following information was found about this possible case: 1) Extracted from 8 A.M. (E.S.T.) weather maps: Jul. 25, ship near lat. 24 N., long. 86.5 W., wind S.E. force 4; ship near lat. 22 N., long. 86 W., wind S.W. force 4; ship near lat. 24.5 N., long. 84.7 W., wind E. force 2; center of a low placed near lat. 24 N., long. 87 W. Jul. 26, ship near lat. 24.7 N., long. 89.3 W., wind N. force 5; ship near lat. 27 N., long. 86 W., wind S.E. force 2, barometer 29.94 inches; ship near lat. 21.7 N., long. 89 W., wind S.W. force 3. Jul. 27, Galveston, wind W. force 4, barometer 29.88 inches; New Orleans, wind S.S.E. force 2, barometer 29.94 inches; ship near lat. 26.7 N., long. 92 W., wind W. force 5; center of a low placed near lat. 29.7 N., long. 93.5 W. (Historical Weather Maps, Jul. 1900). The above information clearly showed the existence of a low pressure area over the Gulf of Mexico which roughly followed a course towards the N.W. and apparently reached the coast near the Texas-Louisiana border on Jul. 27. The actual intensity of the system could not be assessed on the basis of the available data and this was the reason for the author's decision to keep this weather system as a possible case.

D) Case of Oct. 4-5.

The following information was found in relation to this possible case: 1) There was a low over the west Gulf of Mexico from the morning of Oct. 4 to the evening of Oct. 5. It was evidently a

tropical disturbance of minor character that moved in from the Caribbean Sea (Monthly Weather Review, Oct. 1900). 2) The Gulf disturbance is apparently central S. of Port Eads, but has not as yet developed much strength (The New York Times, Oct. 5, 1900, p.11, col.4). The characterization of the disturbance as a minor one (item 1) strongly suggested that it did not reach tropical storm intensity. However, in spite of that, the author decided to keep this system as a possible case.